Qualitative and Quantitative Traditions in Sustainable Design

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Making architecture that responds to the many sustainable narratives that flow through contemporary society cannot easily reside in defined professional or academic traditions. It does not make for simple theoretical constructs with which to frame design processes. Instead, it follows the same paradoxical and sometimes counterintuitive path as sustainable development does within our wider social and cultural environments.

NOTES

1 Max Fordham, "Natural Ventilation," *Renewable Energy* 19, no.1 (2000): 18. Max Fordham is a building services engineer with a lifelong interest in the relationship between architecture, environmental services and sustainability.

2 The author is a partner in the firm of Brennan and Wilson Architects who specialize in rural and sustainable design in Scotland.

3 Gro Harlem Bruntland and World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987).

4 Andrew Blowers, "Environmental Policy: Ecological Modernisation or the Risk Society," *Urban Studies* 34, no. 5 (1997): 845-871. This is an excellent paper that sets out some of the complexities and contradictions to be found in sustainable theory.

5 Tony Becher, *Academic Tribes and Territories: Intellectual Inquiry and the Culture of Disciplines*, *2nd ed.* (Buckingham: Open University Press, 2001).

6 Giles Oliver, "Responsive Practice" in *Architecture and its Ethical Dilemmas*, ed. Nicholas Ray (London: Taylor & Francis, 2005). In part, Oliver's work engages with the

challenges that the architectural profession faces in the UK, in dealing with discipline specialization and new construction procurement methods.

7 Simon Guy and Graham Farmer, "Reinterpreting Sustainable Architecture: the Place of Technology," *Journal of Architectural Education* 54, no. 3 (2001): 140-147. This paper attempted, for the first time, to identify and codify sustainable design typologies.

8 Kiel Moe, "Compelling yet Unreliable Theories of Sustainability," *Journal of Architectural Education* 60, no. 4 (May 2007): 24-30. This article seeks to question the techno-centric stance of sustainable architecture, with reference to cultural commentators such as Giles Deleuze.

9 Susannah Hagan, *Taking Shape: A New Contract Between Architecture and Nature* (Oxford: Architectural Press, 2001).

10 Ibid. p. 3.

11 Ibid. p. 163.

12 Ibid. p. 97.

13 Louis I. Kahn, "Not for the Fainthearted," in *Louis I. Kahn, Writings, Lectures, Interviews* (New York: Rizzoli, 1991), 258.

14 Philip Bray, *Modernity and Technology* (Cambridge, Mass: MIT Press, 2003), 56.

15 John Farmer, *Green Shift: Changing Attitudes in Architecture to the Natural World, 2nd ed.* (Oxford: Architectural Press, 1999).

16 Reyner Banham, *The Architecture of the Well-Tempered Environment* (London: Architectural Press, 1969). This was the first book to explain architecture through the

development of building services, and how it affected and molded the emergence of new building typologies.

17 Colin Porteous, *The New Eco-Architecture: Alternatives from the Modern Movement* (London: Spon, 2001).

18 Rachel Carson, *Silent Spring* (London: Hamish Hamilton, 1963). Although seen as a precursor to the key texts that define the environmental movement, it was concerned primarily with the effects of pollution on wildlife.

19 Donella Meadows, Dennis Meadows, Jorgen Randers and William Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (London: Earth Island Ltd., 1972). This publication was commissioned by the Club of Rome, and established an early computer simulation that worked through twelve global development scenarios that were modeled over two centuries.

20 Andrew Dobson, *Green Political Thought, 4th ed.* (London: Routledge, 2007). This is a definitive and critical overview of the political ideologies of the green movement.

21 Francis Sandbach, "The Rise and Fall of the Limits to Growth Debate," *Social Studies of Science* 8, no. 4 (1978): 495–520. This paper makes an excellent recent history of the various strands that constituted the environmental movement.

22 Edward Goldsmith, "Blueprint for Survival," *The Ecologist* 2, no. 1 (1972).

23 Francis Sandbach, "The Rise and Fall of the Limits to Growth Debate," *Social Studies of Science* 8, no. 4 (1978): 503.

24 Ibid. p. 504.

25 P. Harper and G. Boyle, *Radical Technology* (London: Wildwood House, 1976).

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26 Brenda Vale, *The Autonomous House Design and Planning for Self-Sufficiency* (London: Thames and Hudson, 1975), 7.

27 Maria Telkes, "Space Heating with Solar Energy," *The Scientific Monthly* 69, no. 6 (1949): 394-397.

28 The Tressour Wood House was designed by the author while working at Gaia Architects in Scotland.

29 Pauline Madge, "Ecological Design: A New Critique," *Design Issues* 13, no. 2 (1997): 44-54.

30 Peter Schmid, *Bio-logische Baukonstruktion* (Koln: Rudolf Mueller, 1986). Peter Schmid and others have formulated strategies of "building biology" whereby the design, form, construction and materials of a building were held to have profound consequences for the health and well-being of the building user. Schmid's book is perhaps the best overview of the theoretical underpinnings and architectural outcomes of this approach.

31 Jürgen Habermas, *The Theory of Communicative Action* (London: Heinemann, 1984). This is the key work by Habermas in relation to this field of inquiry.

32 At a "top down" level, international treaty obligations drafted in respect to addressing climate change are translated into "national outcomes." In Scotland's case, this includes the reduction of carbon emissions by 80% by 2050, and specific targets for the construction industry through legislation and statutory standards. Although techno-centric in its operation, the statutory obligations and the commercial imperatives provide a "top down" approach, affecting how building design develops and mutates. In a Scots context, standards for housing have moved from regulating fabric loss to include air-tightness and the use of renewables.

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33 Christopher Gaze and Mike Clift, *Applying the Code for Sustainable Homes on the BRE Innovation Park* (Watford: BRE Trust, 2008).

34 Department for Communities and Local Government, *Code for Sustainable Homes: Setting the Standard in Sustainability for New Homes* (Watford: Communities and Local Government Publications, 2008), 65. Credit scores are given if the building has a ratio of internal floor area to footprint of greater than 3:1.

35 See the BRE PassivHaus primer, available at http://www.passivhaus.org.uk/filelibrary/BRE-PassivHaus-Primer.pdf (accessed January 2011). This document gives a good overview of PassivHaus methodologies applied in a UK context.

36 Dean Hawkes, *The Selective Environment* (London: Spon Press, 2002), 7.

37 Max Fordham, "Natural Ventilation," *Renewable Energy* 19, no. 1 (2000): 17-37.

38 The design of the building structure was undertaken by the author while working at Gaia Architects. Construction and fit-out was undertaken by Brennan and Wilson Architects.

39 Margaret R. Somers, "The Narrative Constitution of Identity: A Relational and Network Approach," *Theory and Society* 23 (1994): 605-649.

40 Ibid.

41 This building and its relationship with landscape narrative is explored in much greater detail in John Brennan, "The Use of Narrative in Contemporary Rural Architecture," *Architectural Research Quarterly* 10, no. 1 (2006): 13-23.

42 Peter Davidson, *The Idea of North* (London: Reaktion, 2000), 242. This book explores the literary tradition of describing "the north" in cultural terms.

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43 Tatjana Schneider and Jeremy Till, *Flexible Housing* (Amsterdam: Architectural Press, 2007). This book is an excellent overview of a design tradition in adaptable housing.

44 Although researching non-domestic environments, "Adaptable Futures" is conducting useful research into flexible building and its benefits for sustainable development. A good publication is: Katy Beadle, Alistair Gibb, Simon Austin, Fuster Alumdena and Peter Madden, "Adaptable Futures: Setting the Agenda," *Adaptable Futures* (2008) available at http://www.adaptablefutures.com/downloads/Beadle_et_al_2008.pdf (accessed March 2010).

45 Milton Keynes Development Corporation, *Tattenhoe Park Development Framework Chapter 7: Super Flexible Housing*. Available at http://www.miltonkeynespartnership .info/DocLibrary/Tattenhoe_Park_Development_Framework_Chapter_7.pdf (accessed June 2010). This document gives a good overview of current best practice and innovation in this field.

46 Stewart Brand, *How Buildings Learn: What Happens After They're Built* (New York: Viking, 1994), 178.

47 Tatjana Schneider, *Flexible Housing* (Amsterdam: Architectural Press, 2007), 7.

48 Scotland's Housing Expo ran in August 2010 in Inverness. It included 40 exemplar dwellings selected by open competition to illustrate and encourage innovation in the housing sector.

49 "Designing for Survival, the President Introduces His Long Life/Loose Fit/Low Energy Study," *RIBA Journal* (1972). No author cited

50 Ibid.

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FIGURE CREDITS

Fig. 1: MIT Museum

Fig. 2, 4 to 10: John Brennan

Fig. 3: Colin Wishart

Fig. 11: Nigel Rigden

Fig. 12: Nick Sharp